

AIR COMMAND AND STAFF COLLEGE

AIR UNIVERSITY

HOW THE USAF CAN LOSE THE NEXT WAR
LOSING AIR SUPERIORITY

By

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Preface

The topic addressed in this paper and the alarming trend in air superiority focus is truly significant. Though I realize most of my conclusions fall on the airpower advocate side of the argument, it does not undermine the fact that this issue is very important to the United States of America. The research methods used in this paper are case study, problem/solution, and descriptive statistics method. Thanks to my advisor, Dr. Don MacCuish, for his guidance on topic selection. I would also like to point out the work done on this topic by Dr. Rebecca Grant. Her research strongly influenced this paper.

Abstract

The United States is precariously close to giving away air superiority. Control of the air is arguably the most important enabler of modern combat, and is documented as such in American doctrine. From its inception, the USAF has tended to discount the air superiority mission. Over the last 15 years those with an interest in challenging the west have been adapting and finding ways to counter U.S. technology. In roughly this same time, the USAF has added only the F-22 while retiring the F-4G, EF-111, and F-117. In 2009, the threat of advanced SAMs like the SA-10 and SA-20 and aircraft like the SU-35, Rafale, and Typhoon are equal to or exceed our 4th generation aircraft. Allowing near parity to exist is not acceptable, because an adversary denying the U.S access to the battle space could win the conflict. These conditions are risk intensive, and air superiority is too important to risk losing.

Introduction

The United States finds itself in a unique position at this time in world history. Our marked preponderance of power and influence relative to the rest of the globe often forces America to act, usually with the military, in places we would prefer not go. A global insurgency, weak and failing states, and a tenuous relationship with the United Nations force the only superpower into a reluctant role as the world's police force. The most likely scenario for the next decade or more is that the U.S. will be involved in an increasing number of regional conflicts and small wars. Certainly, it is unlikely that world peace and cooperation will dominate Pax Americana. National leaders have not developed a coherent strategy to meet this new security environment.

The current direction of our defense posture is setting the United States along a path that could lead to defeat in a future conflict. Airpower has been the asymmetric advantage of the U.S. military since Operation Desert Storm. In particular, no western-led joint or coalition operation in the future would even begin to get off the ground without air superiority. Joint publications, military doctrine, and American thought are all based on the fundamental premise that we will have air superiority. Future planning at this very instant assumes this as a fact. Unfortunately, this may not be the case in the future. No American soldier has been attacked by enemy aircraft since 1953. Only a concerted, conscious effort over the years made this protection possible. It is easy to assume air superiority, but potential outcomes without it can yield potentially dire results.

While the U.S. has shifted focus towards fighting the Global War on Terror, potential enemies have adapted. Iran, China, and Russia have had the advantage of observing our operations and gathering intelligence from Operation Allied Force in the former Yugoslavia to

current actions in Iraq and Afghanistan. They clearly recognize the importance of American airpower and the fact that we count on it as our decisive force multiplier. With this viewpoint, they have been working to counter this threat for over a decade. Meanwhile, the USAF and the DOD have deemphasized air superiority. They have not replaced the F-4G, EF-111, F-117, or F-15C. In some cases, the capability these aircraft brought to the fight simply no longer exists. In others, the Air Force does not possess aircraft in enough numbers to yield the desired effect. Comprehensively, very little has been achieved in the last 20 years to guarantee air superiority. The only exception is the F-22 Raptor, which currently has a contract for only 183 aircraft.

Meanwhile, the adaptations of our foes have resulted in capabilities that can match or counter what the U.S. has right now. Advanced SAMs such as S-300 and S-400 (NATO SA-10 and SA-20) can effectively deny access to the battle space to our Non-LO (Low Observable) platforms. The Russian Flanker variants such as the SU-30 and SU-35, the French Rafale, and others are equal to or exceed the capabilities of all our fighter aircraft except the F-22. Though it is not likely we will fight a war against any country with these assets in the immediate future, you go to war with the Air Force you have. In the United States, the acquisition cycle requires well over ten years of lead-time. Thus, the U.S. needs to be following a line of procurement and focus that is thinking 20 years in the future. American history is rife with supporting countries that later turned into adversaries such as Iraq, Iran and others. Furthermore, it is extraordinarily difficult to predict geopolitics in general and determine who could become potential adversaries. From a realist, self-preservationist perspective, the United States must maintain the ability to defeat any future competitor.

To analyze this situation, this paper begins with defining air superiority and its importance and how the USAF has historically viewed the mission. Next, the level of

unprecedented advantage by the U.S. in the 1990s is examined, as well as how potential enemies have countered this advantage. The trend in the USAF is next, which compared to the existing and future threat shows the potential capabilities gap. Lastly, the impact of losing air superiority in potential future encounters is analyzed demonstrating the value of controlling the air.

The current trajectory could end with the U.S. military in the position of being unable to accomplish national strategic objectives. The USAF in particular has a checkered history of discounting air superiority. Strategic Air Command's (SAC) dominance over Tactical Air Command (TAC) after World War II and the predictable results in Korea and Vietnam are the most striking examples. Several compromise solutions exist concerning the F-22, but many of them are invalid upon closer examination. The problem, however, ranges well beyond any particular airframe. The USAF needs to refocus on air superiority because it is the center of the true identity of the independent Air Force. If you cannot provide air superiority, what is the purpose of having an Air Force at all?

Air Superiority is Vital

Air superiority is defined by Joint Publication 3-30 as "That degree of dominance in the air battle of one force over another that permits the conduct of operations by the former and its related land, sea, and air forces at a given time and place without prohibitive interference by the opposing force."¹ Simply put, it is freedom of maneuver in the air. Generally, air superiority is not an end to itself but is the first stepping stone towards other joint operations accomplished from the air, land, and sea.

American doctrine explicitly states that air superiority is a vitally important prerequisite to the employment of military power. The first official air power document published in 1943 by the U.S. Army, FM 100-20, recognized the value of air superiority when it stated that "The

gaining of air superiority is the first requirement for the success of any major land operation.”² Joint Publication 3-01 quotes Field Marshall Bernard Montgomery “if we lose the war in the air, we lose the war and lose it quickly.”³ The same Joint Pub later states “historically, air superiority has proven to be a prerequisite to success for an operation/campaign.”⁴ The US Army also acknowledges in FM 100-5 the importance of control of the air. It is somewhat surprising, then, that in spite of the importance clearly given air superiority in American literature how little it is being emphasized in practice.

The 2006 QDR states that one of its fundamental imperatives is to “Continue to reorient the Department’s capabilities and forces to be more agile in this time of war, to prepare for wider asymmetric challenges and to hedge against uncertainty over the next 20 years.”⁵ The Department of Defense is trying to emphasize the need for flexibility in this document and that the American military must be able to respond across the spectrum of conflict from Irregular Warfare (IW) to full spectrum conventional conflict. Although many feel that the military should place more emphasis on current IW conflicts, the need for air superiority is clearly implied.

Controlling the air enables the rest of the fight. Air Force Doctrine Document 2-1.1 clearly identifies air superiority as a core competency, and that control of the air is necessary in today’s war.⁶ A key part of recent US Army and Marine success has been their immunity to attack from the air. Helicopter fires and air assault tactics would be ineffective without air superiority. Defensive measures would drastically hinder their maneuverability and ability to take the offensive to exploit enemy vulnerabilities. A carrier strike group would be much less efficient if it had to be moved 200 miles farther away from the AOR due to the loss of air superiority. In order to appreciate air superiority, you must be able to visualize what the battle

would look like without it.

It is imperative that all members of the joint force from the President of the United States to the average platoon leader understand the value of air superiority. There is no doubt that U.S. forces must have air superiority in order to accomplish the will of American leadership. Once a central strategy is decided upon that guarantees control of the skies, leadership can move on to assigning other tasks to accomplish the mission. The respected airpower author Robert Pape recognized this when he said, “The central question in air strategy is what to attack once air superiority has been achieved.”⁷ General Eisenhower also understood the concept well while discussing the packed roads in Normandy with his son after D-Day when he said, “If I didn’t have air supremacy, I wouldn’t be here.”⁸

Historical Viewpoint

The United States Air Force has a heritage of repeatedly undervaluing the air superiority mission. Almost from the beginning of the Army Air Corps, the burgeoning force desired to have a strategic-level impact that was decisive and focused on missions to accomplish this goal. Though most early air power theorists saw the value of air superiority, it fell by the way side in the early part of WWII to the great detriment of the allies. By the time the Normandy invasion began, the USAAF had begrudgingly begun to support tactical aviation, which was a vital piece of the campaign. However, following WWII, the newly independent U.S. Air Force began to focus almost exclusively on nuclear strategic bombing with the formation of Strategic Air Command (SAC). The result of this focus was demonstrated in the Korean and Vietnam conflicts. Eventually, however, the service learned and invested in air superiority with the F-4G and F-15. The Israelis, using mostly American technology, benefitted greatly from the western experience and exploited the value of air superiority in 1967 and 1982. The benefits of the

Vietnam era experience have been enjoyed for over 30 years, but the USAF is in danger of learning another lesson the hard way.

It is commonly accepted that Billy Mitchell is the father of the USAF. He was unequivocally that most vocal supporter of airpower during WWI and the interwar period. His experience in WWI strongly influenced his theoretical background, and he was originally a strong advocate of air superiority. After his highly publicized court martial in 1925, however, he shifted towards a policy that advocated Douhet-style strategic attack above other missions.⁹ One of the primary factors underlying Mitchell's agenda was the desire for an independent Air Force. Billy Mitchell influenced many of the aviators in upper echelon leadership positions during WWII, and his strategic bombing agenda was carried forward.

The Air Corp Tactical School (ACTS) continued to carry the "bomber will always get through" concept from Mitchell through the interwar period.¹⁰ Claire Chennault was a very vocal opponent to the strategic bombing mafia and advocated pursuit aviation. However, influential leaders like Lt Col "Hap" Arnold took the position that "It is impossible for fighters to intercept bombers and therefore it is inconsistent with the employment of air force to develop fighters."¹¹ The ACTS was the center of thought and strategy development throughout this period, and the leanings of the bomber mafia strongly influenced the diminishing role of tactical aviation and air superiority.

Even as the United States observed the Battle of Britain and Hugh Trenchard's utilization of airpower, the U.S. military was crafting a strategic bombing campaign for WWII. The RAF itself refused to commit its bomber force to attack the Luftwaffe because the bombers were too valuable. The result of this school of thought was the Combined Bomber Offensive (CBO), which originally began with daylight campaigns of unescorted heavy bombers like the B-

17. The strategic results of the CBO are debatable, but it did not coerce Germany into surrendering and was not decisive in itself without the use of ground forces. The effectiveness of the CBO, however, was greatly increased when the P-51 with drop tanks was brought to bear as a long-range escort. Bringing the fight to Germany depleted the Luftwaffe, and directly led to the air dominance achieved over Normandy during Operation Overlord. Even on the eve of this tremendous operation, however, the USAAF had to be forced over stringent objections to provide direct air cover and tactical aviation to support the Army and Navy. The single event that had the biggest impact on the newly formed U.S. Air Force in WWII, however, was the nuclear bombing of Hiroshima and Nagasaki.

The advent of the nuclear age was a perfect fit for the historical leanings of the Air Force toward strategic bombing in spite of how World War II clearly demonstrated the value of air superiority. Culturally, the USAF was unable overcome institutional blindness. Strategic Air Command soon became the poster child for the USAF, with bombers constantly on alert and nuclear weapons ready for use at any moment. Tactical Air Command (TAC) on the other hand, eventually became only a headquarters with no assigned aircraft. The first commander of TAC and a hero of the Normandy invasion, Gen Pete Quesada, quietly retired in a “small ceremony attended by more Army officers than Air Force officers”.¹² When the Korean Conflict started in 1950, the USAF was unprepared in many ways. Though it had developed several jet fighters, they were in short supply. The Far East Air Force (FEAF) had a very limited number of F-80s to begin the war, and requested a significant plus up. The decision was made, however, to send primarily WWII era F-51s instead of F-80s.¹³ As Chinese and Russia involvement on the peninsula increased, the Air Force was surprised by the technological prowess of the Mig-15 and the ability of its pilots. This development forced the United States to rush the new F-86 into the

conflict, which leveled the playing field. Despite the clear evidence that the USAFs control of the air could be challenged and that support of ground troops is important, institutionally the Air Force remained focused on the nuclear mission. This was largely due to Curtis LeMay, who became Vice Chief of Staff in 1957 and four years later Chief of Staff for the Air Force.

Tactical aviation received little funding during and after the Vietnam War because of LeMay's focus on SAC. In order to obtain any new fighters at all, they had to have a nuclear capability. This resulted in the F-100, F-104, and F-105 being mainstays of the USAF in the late 1950s and 1960s. Additionally, the USAF piggybacked on a Navy program for the F-4. However, with the introduction of the Mig-21, all American fighters were at a disadvantage when within visual range. Fighters designed for high-speed intercepts of Soviet bombers and multi-role aircraft with a nuclear capability were not agile in a dogfight. The original F-4 did not even have a gun. However, what eventually became the most significant threat to American air superiority was the SAM threat and AAA. The F-100 became the first Wild Weasel platform designed to suppress enemy air defenses in 1965, but the United States still suffered significant losses throughout the war.¹⁴

The Israeli Air Force (IAF) went through a similar learning curve. During the 6 Day War in 1967, the IAF concentrated on obtaining air superiority as their first objective. Their surprise attack yielded amazing results, crippling the Egyptian Air Force in less than three hours and destroying 380 aircraft in the first day.¹⁵ The short conflict was an absolute and complete victory for Israel. In 1973, however, the Yom Kippur War had a significantly different character. The same Russian SAM threat that the United States was facing in Vietnam had been exported to the Middle East. The Israelis were aware of the threat, but were blinded by their overwhelming success in 1967. The mobile SA-3 and SA-6 as well as the SA-2 systems significantly impacted

the IAF's ability to gain air superiority. Israel reported over 40 losses in the first two days, but some estimates place the actual number closer to 80.¹⁶ Regardless, the ability of the IAF to support its ground troops was severely limited reducing the effectiveness of its total force.

The United States and Israel effectively learned the air superiority lessons of the 1970s. A key result of this period was the development of a fourth-generation air superiority fighter, the F-15. Electronic warfare platforms and unmanned vehicles also first became operational during this time. Israel was the first to test these concepts and platforms in combat during the 1982 Bekka Valley conflict. The result of the air war was nothing short of miraculous. Despite advanced Russian SAMs and aircraft, the IAF achieved an 87 to 0 kill ratio.¹⁷ The Gulf War was also a resounding success for the United States in 1991. This conflict also revealed the effectiveness of a classified program that was developed in response to the SAM threat during the late 1970s, the F-117.

The Vietnam-era lessons learned yielded a tremendous air superiority capability for the United States. However, history is cyclical and many military mistakes are repeated over time. The 2006 DOD QDR identifies four priorities as the focus of the report: "Defeating terrorist networks, defending the homeland in depth, shaping the choices of countries at strategic crossroads, and preventing hostile states and non-state actors from acquiring or using WMD."¹⁸ The U.S. military, in the relatively short air power period, overlooked air superiority yet again. Previously, the loss of focus was due to cultural problems and an over reliance on the theory of strategic bombing. Currently some of the same cultural blindness and short sightedness is beginning to reappear.

Adaptation of Potential Adversaries

Potential enemies of the United States have learned from our recent successes and are trying to catch up. General John Corley, commander of Air Combat Command, recently said: “Everybody has figured out that airpower - specifically, from the U.S. Air Force - is American’s asymmetric advantage. They want to take that away from us.”¹⁹ The overwhelming results and effect of decisive air power in Operation Desert Storm was a significant event for the rest of the world. Stealth technology was used for the first time as an important piece to a major operation, and those opposed to the west felt extraordinarily threatened. The war served as a wake-up call, and forced other countries to acknowledge American military hegemony. Maj Gen Vladimir Slipchenko of the Russian general staff said “in Operation Desert Storm, air power was responsible for victory because air superiority altered the complexion of war from outset.”²⁰ Even in this highly successful conflict, however, nearly every major weapons system lost an aircraft. Furthermore, even though the U.S. clearly dominated the air war, the dense surface threat environment still posed a difficult threat for coalition aviators and negatively affected operations.²¹

Operation Allied Force over Kosovo was the first observable chink in the armor of American air power. An F-117 Nighthawk, previously viewed as invulnerable to air defenses, was shot down in 1999. A 2006 interview with the SAM operator, Col Dani Zoltan, revealed that his SA-3 battalion was able to accomplish the feat through relatively minor modifications to existing equipment and good radar transmission discipline.²² Even as this occurred, the USAF was continuing with its trend to maximize the number of Low Observable aircraft in its inventory.

Exercise Cope India with the United States and Indian Air Forces also demonstrated that the rest of the world is starting to improve. The exercise was commonly acknowledged as a clear defeat of the American forces and the F-15C in particular, although in fact they fought under relatively stringent constraints.²³ However, it is undisputed that the Indian Air Force presented a formidable foe that performed much better than expected. An American pilot involved with the exercise said “the outcome of the exercise boils down to [the fact that] they ran tactics that were more advanced than we expected”.²⁴ The Indians accomplished this victory using a mix of French, Russian, and Israeli technology. They flew MiG-21s, SU-30 Flankers, and French Mirage aircraft.²⁵ The ominous piece of this exercise was the quality of the equipment provided by known technology exporters. At this time the United States is not concerned that we will be engaged in a conflict with India, but it is impossible to guarantee with any certainty what other nation may have purchased similar technology.

The People’s Liberation Army Air Force (PLAAF) has earned a measure of credibility over time, with successful involvements in Korea, the 1958 Taiwan Straits crisis, and in Vietnam.²⁶ Operation Desert Storm shook the PRC when they realized that their traditionally defensive posture was no longer viable. The use of precision guided munitions (PGM), cruise missiles, and stealth technology had changed the character of modern combat.²⁷ Now, it is the clear objective of the PLAAF to stand relatively co-equal with the United States. China is planning to boost its defense spending in 2009 by 18%, resulting in a total spending of \$61 Billion.²⁸ The PLAAF commander, Liu Shunya, stated in 1997 that:

The Chinese Air Force plans to acquire state-of-the-art weapons systems by early next century, including early warning planes, electronic warfare warplanes, and surface to air missiles. The PLA Air Force is now able to fight both defensive and offensive battles under high-tech conditions.²⁹

China is also a country known to share military intelligence and technology. The downing of an American EP-3 in April 2001 in particular provided the opportunity to gain valuable pieces of intelligence about American operations.

A significant movement exists in numerous countries to advance their indigenous fighter capability. Russia, India, and China all have publicly announced fifth generation fighter programs. Sukhoi is working on a fifth generation fighter, known only as the PAK-FA, and very capable fourth generation SU-30s were sold in 2007 to Algeria, India, Malaysia, Indonesia, and Venezuela.³⁰ The PRC has developed the advanced PL-12 that is assessed to be nearly equal to the American advanced medium range air-to-air missile (AMRAAM).³¹ The technology is out there in the world today, and it is very difficult to assess who might obtain it over the next decade.

Even though even our closest peer competitor cannot afford to challenge the United States with a fleet of SU-37s, there are much more affordable means to mitigate the U.S. advantage. Currently, the proliferation of SA-10/20's, next generation Russian Flanker aircraft, advanced jamming, and counter stealth technology is an unpleasant fact. As exercise Cope India demonstrated, our current 4th generation aircraft like the F-15 and F-16 are on par with the Indian and Russian built aircraft. The gap between the U.S. and the rest of the world is narrowing.

US Military Trend

Since the early 1990s, the USAF has continued to take away counter air and air superiority capability while replacing it with very little. Unfortunately, 2009 began with the Air force focused on reinvigorating the nuclear enterprise, Unmanned Aerial Systems (UAS), and IW. Air superiority receives little to no mention, with the exception of the F-22. Critics of the Raptor have been very vocal, but the program is indicative of a fighter force in general that is in

decline and will face serious problems five to ten years in the future. Furthermore, the EF-111 and F-4G were not properly replaced for the electronic attack and Suppression of Enemy Air Defenses (SEAD) mission. The USAF has still not solved the next generation tanker issue, and the E-10 aircraft is unfunded. Current acquisition cycles are well over ten years, so any deficiency requires a significant amount of time to rectify. The overall picture of the pieces that ensure air dominance shows a negative trend.

The focus of the USAF is openly not on air superiority. The Chief of Staff, General Schwartz, articulated his brief vision during the AFA convention keynote address in September 2008. He discussed his priorities of nuclear excellence, UAS and ISR for the war fighter, and the acquisition process.³² Nowhere to be found was preparation for conflicts where air superiority could be challenged. This is not completely surprising, since his predecessor was fired in part for his ardent support of the F-22. Ongoing conflicts in two theaters and a global war with terrorists should certainly not be discounted. However, the disdainful terminology used by Secretary Gates, “Next War-Itis”, shows a view very focused on the here and now.

The F-22 program is currently at a decisive turning point and illustrates very accurately the direction of the USAF. Originally, the plan called for a replacement of the F-15C by the F-22 on a one for one basis. The buy was reduced by the first Bush administration to 680, the Clinton administration to 442, the 1997 QDR to 339, and finally in 2004 to 183.³³ Secretary Rumsfeld is responsible the most current decision when he signed Program Budget Directive (PBD) 753, which is where the program sits today. For the program to survive at all, it had to add an air to ground capability and even temporarily re-designated the aircraft the “F/A-22” to try to garner support. The F-22, however, is just the tip of an even more dangerous iceberg.

The USAF made a conscious effort to modernize their fighter fleet after Operation Desert Storm and focus on stealth technology. New aircraft production severely declined in the 1990s, going from 104 in 1991 to zero in 1995.³⁴ To make matters worse, the projected fighter gap continues to widen as combat operations in Iraq and Afghanistan are forcing our current A-10, F-15, F-16, and F-18 aircraft to wear out faster than predicted.³⁵ The F-22 and the F-35 were the pieces of the get-well plan, but now the entire road map is untenable. The Air Force is currently looking to push forward the retirement of older aircraft, with the Pentagon considering phasing out 300 F-15 and F-16 aircraft during the 2010 fiscal year.³⁶ The F-16 replacement, the F-35, will not reach Initial Operational Capability (IOC) until 2013, according to Lockheed Martin.³⁷

Although the F-22 and F-35 are at the forefront of the air superiority debate, in reality the problem has much wider implications. The F-4G “Wild Weasel” retirement left a significant hole in the USAF force structure. As Major General Corder, deputy to General Horner in Operation Desert Storm, said “the demand for weasels went right through the roof” after the F-4 proved its worth.³⁸ Though the Gulf War was a cohesive use of many airframes and services, the airpower results were impressive. The allies flew over 112,756 combat sorties for only 44 losses, which is an incredibly low rate of 0.06%.³⁹ When the two-seat F-4G was retired in 1996, it was replaced with a less capable airframe, the F-16.⁴⁰ A 1996 GAO report said that the F-16 was “recognized as much less capable than the F-4G and was originally intended only as an interim system until an equivalent capability to the F-4G could be developed and fielded”.⁴¹ The original plan was to replace the F-4G with a variant of the F-15, the F-15PDF, that was not funded.⁴² Although there have been improvements to the F-16CJ over the years, it still is not a pure wild weasel platform.

The EF-111 was the last airborne electronic attack platform operated solely by the USAF. When the last EF-111 was retired in 1997, the Air Force, Navy, and Marines came to an agreement that the EA-6B Prowler would be available for Air Expeditionary Force deployment support.⁴³ The EA-6B, though a capable jammer, presented several problems for the USAF because it is much slower than the EF-111 and cannot keep pace with a fast attack strike package. This overall agreement, however, will end in 2012 when the Prowler is retired.⁴⁴ Though the US Marine Corps will continue to use the EA-6B, the US Navy will be moving their electronic attack mission to the EA-18G Growler, a variant of the Super Hornet.⁴⁵ At this time, the F-35 has begun development on their Next Generation Jammer (NGJ) system; however, it is in its infancy and will not be part of the initial F-35 package.⁴⁶ The Air Force has looked at several programs to fill this gap including a B-52 based standoff jammer, but currently it appears there will be a complete capability gap in 2012.⁴⁷

Fighter and fast moving aircraft are not the only airframes that are in need of increased capabilities. The Air Force has tried three times in the last seven years to procure a replacement for its aging KC-135 tanker fleet, some of which were delivered in the 1950s.⁴⁸ At this time, the contentious competition is delayed and there is still no final decision on how the Air Force intends to move forward.⁴⁹ Air superiority and power projection in general require the air refueling capabilities provided by the USAF. The E-3 airborne early warning and control systems are also aging, with the average age now being over 30 years.⁵⁰ The replacement for the E-3 that could have encompassed the capabilities of the E-3, RC-135, and JSTARS into one airframe was the E-10. However, the program funding was cut in fiscal year 2008.⁵¹ Thus, no replacement aircraft are identified for these crucial airpower enablers.

Current Airpower Balance

Threat systems are currently in place that could significantly impact the ability of the United States to project air power. At this time, the biggest threat to the USAF is the advanced SAM based on the Russian SA-10 and SA-20 family. Non-LO aircraft such as the F-15 and F-16 cannot achieve access to the battle space without an integrated jamming and drone game plan. Large, non-maneuverable aircraft such as tanker or command and control assets have to be moved farther away from the area of concern, reducing their effectiveness. At this time, Russia, China, and 16 other countries to include Syria operate these systems.⁵² China's SA-10 and SA-20 systems are currently operational in various locations throughout their country.⁵³

Viable threat fighter aircraft are also already operational. Gen Richard Hawley, then commander of ACC, said in 1998 that "the F-15 will not be able to operate effectively against upcoming threats such as four-and-a-half and fifth-generation fighters like the Eurofighter and Rafale and upgraded versions of the Sukhoi Su-27".⁵⁴ Furthermore, it is the Air Force position that the Eagle has minimal survivability in an advanced surface threat environment. At this time, nine countries operate fighter aircraft from the Flanker family. According to Jane's Defense, the notable countries are China, Vietnam, Ethiopia, Indonesia, and Venezuela.⁵⁵ Six of the nine countries also own advanced Russian air defense systems augmented with the S-300 family of SAMs.

Electronic attack systems are in use around the world that could level the playing field to a more manageable level. Modern IADS are in existence at this time in various locations, and countries like Iran have made their systems much more survivable. Following Russian doctrine, the NATO SEAD mission against Serbia was relatively ineffective in achieving complete dominance managing to destroy only 3 of 25 mobile SA-6 batteries for a success rate of 12%.⁵⁶

However, at this time likely adversaries of the United States are generally operating more antiquated systems than most Western nations. In summary, although the gap has narrowed considerably, the United States can be reasonably assured of obtaining air superiority in the near term. Air supremacy however, is unlikely to be obtained against a determined enemy. A potential adversary would most likely be able to maintain the ability to shoot back and at least disrupt to some degree American air power.

Future Gap in US Capability

The potential problems for American airpower come in three primary forms: not enough fighter numbers, missing EA and SEAD ability, and reliance on some very old machines. Beginning in 2013 and continuing until beyond 2017 the USAF will be in a very tenuous position. In this period at the bottom of the “fighter bathtub”, the United States will be vulnerable.

As was previously discussed, the 1990s plan to modernize the fighter fleet has fallen apart (See Appendix A). Budgetary constraints and decisions by numerous political administrations have led to an impending situation where the USAF is ill-prepared. Lt Gen Daniel Darnell, Deputy Chief of Staff of the Air Force, testified in April 2008 that the current F-22 buy and production plan for the F-35 will yield a fighter gap that begins in 2017. The USAF will be 800 short in 2024 of the requirement for 2,250 fighters called for in the 2005 National Military Strategy.⁵⁷ In some ways, however, this problem is actually understated because it relies on an airplane that has barely even begun testing, the F-35 Lightning II.

Admiral Michael G. Mullen, Chairman of the Joint Chiefs of Staff, acknowledged there could be problems with the F-35 when he said while discussing the airplane that “new systems usually struggle...meeting exact deadlines”.⁵⁸ In addition, the F-35 program has taken the unprecedented step to begin low rate production while still completing the operational test and

evaluation phase. Charles McQueary, a retired Air Force general with experience in the test community, agrees that the Lockheed plan of reducing test flights through better use of technology has some merit but that a better balance should be found.⁵⁹ The company reduced the total number of test aircraft by two, and a downward trend has occurred this year in suitability test results.⁶⁰ This course will save costs, but is very risk intensive because airplanes will be produced without proof that all systems work properly. These pieces combined with Lockheed Martin's difficulties with the F-22 make it likely there will be delays. As Gen Darnell alluded to, the Air Force is counting on the F-35 to provide the required mass for power projection. If the F-35 is not IOC in 2013, the fighter shortage of 800 aircraft could in fact be much greater and happen earlier than 2017.

Analyzing the use of air superiority fighters in Operation Desert Storm demonstrates that eventually numbers do matter. The Gulf War, though not a true full-scale air war, is an appropriate example because its size is typical of a regional, small war that is likely to occur in the future. For this conflict, the U.S. deployed 124 F-15Cs to Saudi Arabia and Turkey. Saudi Arabia utilized their fleet of 81 F-15s and approximately 50 different Tornado versions were deployed, yielding a total number of over 250 dedicated air superiority assets.⁶¹ With a total buy of 183 F-22s, the amount available for combat operations is 126 due to training and test coded aircraft. The USAF required Mission Capable (MC) rate is 80%, which means the number available at any given time is 108. The size of the F-15C fleet is currently 442, with the majority forecast to be in the Air National Guard.⁶² The ANG has the primary responsibility for homeland defense, meaning a portion of the F-15Cs would not be able to deploy.

Thus, the absolute maximum number of fifth-generation fighters the U.S. could deploy is approximately half the air superiority force used in Operation Desert Storm. The F-22 carries the

same number of air-to-air missiles as the F-15. If a country is willing to accept large losses, it could overwhelm the Raptor force with sheer numbers. Advanced jamming could double the number of missiles required per kill, further exacerbating the problem. Another issue is purely geographical. Current air-to-air missiles have a limited range, requiring a fighter to be in front of an adversary geometrically to achieve a kill. Even with the F-22's ability to super-cruise, it can only cover so much distance. Though it can cover a larger AOR than a slower aircraft like the F-15C, the distance is limited in scope. Because of this problem, a future mid-sized war requires using the F-15C or other legacy aircraft to fill the gap. It is important to realize that this is only a single conflict and assumes resources are not needed elsewhere. Multiple hot spots make the problem practically unmanageable.

The venerable F-15C has an amazing track record, but it is growing old. In 2008, the average age of the fleet was over 30 years. The last F-15C came off the line in 1986 (See Appendix B).⁶³ Without a significant increase in the F-22 buy, the USAF will need the F-15 until approximately 2020 and perhaps even beyond. In 2010, the vast majority will be past their original projected life span. Furthermore, the airplane was first produced in the early 1970s and was based on 1960s technology. The F-15 will require significant upgrades to ensure structural integrity as well as avionics viability. In 2007, an F-15 from the Missouri ANG fell apart in flight due to structural failure that caused a fleet wide grounding.⁶⁴ As the Air Force continues to try to get more mileage out of the F-15, these incidents will only increase in frequency. Retired Gen Gregory Martin, previous Commander of Air Force Materiel Command, noted that the F-15 was not supposed to be in service as long as it has and that "The question wasn't if they would fail, it was when those failures would occur."⁶⁵ An untimely grounding would lead an already undersized force to be stretched beyond capacity.

A second piece of the tired airframe problem, the KC-135, deserves a brief mention. The USAF's problems with acquiring a new tanker are common knowledge. However, in the 2013 period when all these varied problems converge, it will still be a mainstay of the air refueling fleet. The average KC-135 is over 45 years old.⁶⁶ Without question, the USAF should have replaced it years ago. The small wars discussed previously would have ancient tankers refueling very old fighters as a vital piece of the air power battle. This combination results in the assumption of significant risk.

Lastly, the Air Force SEAD problem can only be addressed by the F-35. With no other airframes forecast to come online, it is simply the only option. However, the SEAD capability for the F-35 will not exist until well beyond 2013. Until nearly 2020, the Air Force will still be dependent on the stopgap solution of the F-16CJ. It will also be entirely dependent on the USN for the jamming piece of the SEAD mission. The Navy next generation jamming platform, the EA-18 Growler, is projected to have a final number of 85 aircraft.⁶⁷ During the years of the USAF/USN agreement, the power of the Air Force was tied to the availability of approximately 100 15-20 year old EA-6Bs.⁶⁸ In the upcoming gap, however, the Air Force will be even more reliant on Navy support with an airframe that is in higher demand than the EA-6. Even worse, the solution to this problem is also based on emerging technology. A 2006 GAO report expressed misgivings about the possibility for program delays and cost increases based on the Navy acquisition and test process that will have one-third of the total EA-18 procurement complete based only on limited test demonstrations.⁶⁹

The USAF will have a serious capability gap beginning in only three short years. The F-22 production rate coupled with poor comprehensive planning will result in there being too few fighters in the inventory. Additionally, the Air Expeditionary Force (AEF) construct will not be

organically sustainable by Air Force assets. Reliance on Navy platforms in today's joint fight is not a problem. However, in some circumstances it does lead to an over reliance on certain already heavily tasked aircraft. What American airpower needs to be successful will be woefully thin in certain key areas. With the U.S. forced to continue to count on legacy aircraft, we could require coalition help for fourth-generation plus aircraft like the Eurofighter. This environment creates an opening that is exploitable by a determined foe.

Problem Significance

For many involved in the current airpower debate, it is difficult to see beyond current operations in Iraq and Afghanistan. To their credit, the USAF and military as a whole recognized they were unprepared for IW and COIN and needed to catch up. It is easy to make the leap to predominately structuring the force to fight the war that is occurring in the here and now. Air superiority, however, is not a capability to toy with because the consequences could potentially be extreme. The American public does not deal well with images of U.S. service members being drug through the street as occurred in Somalia. Modern media operates for all intensive purposes at real time speed. A downed aircraft of any type is a PR disaster, and it is hard to imagine the backlash if we lost five or six in a day. A recent real world situation and several potential hot spots illustrate what could occur.

A resurgent Russia flexed her muscles in 2008 by invading a nation friendly to America, Georgia. The conflict was airpower intensive from the beginning. Russia utilized TU-22 bombers and Su-25 attack aircraft under the support of air-to-air Su-27s to rout the Georgian forces.⁷⁰ Control of the air was not completely undisputed, however, as the Georgian air defenses did down several Russian aircraft.⁷¹ Under different political circumstances such as ethnic cleansing or genocide, the United States could have elected to intervene on behalf of

Georgia against the Russian forces. In such a situation, air superiority would have been strongly contested.

Russia could have moved advanced mobile SAMs such as the SA-12 or fixed SAMs like the SA-20 to the edge of its border. Such an IADS would have effectively covered the entirety of the nation of Georgia. Against this type of a robust system, legacy aircraft such as the F-15 or F-16 would be completely ineffective. The only survivable systems against this defense are the LO F-22 and B-2. To complicate the problem, there would be significant political constraints involved that would most likely not allow attacking systems inside Russia's borders. In this case, it is practically impossible to gain air superiority. The F-22 could destroy enemy aircraft, but advanced SEAD and self-support jamming would be essential for legacy aircraft and their robust air-to-ground capability to enter the fight. Unfortunately, the USAF and even the USN do not have such a capability. Thus, if the United States truly wants to project airpower in this scenario aircraft and human losses would have to occur. Furthermore, the Army would be denied key pieces of maneuver and firepower in their helicopter fleet. In the age of the "CNN Effect", it is doubtful that the American people would stand for a parade of POWs on Moscow TV or dead bodies in the street. It is a relatively direct train of logic to see how this situation could result in the United States military withdrawing and not accomplishing national objectives.

Iran is another hot spot that could require intervention by the United States. Though Iran currently flies antiquated western aircraft with a mix of Russian technology, reports have been confirmed that Iran has contracted for the advanced SA-20 SAM system.⁷² With a potentially strong oil market and the desire to assert regional power, Iran is likely to continue upgrading their military defense capabilities throughout the timeframe of the air superiority gap. If Iran obtained a nuclear weapon or if acquiring it was imminent, the international community would

require action. For the U.S. in particular, nuclear proliferation is not acceptable because of its destabilizing effect. Depending on the timing of this scenario, it is possible that the U.S. Navy would have the preponderance of firepower in the region. Additionally, it is likely that a more independent Iraq would not allow attacks from their country on neighboring Iran. The fixed wing strike aircraft for the USN consists entirely of F-18 Hornet variants. It does, however, have additional capability via the Tomahawk cruise missile. The issue in this situation becomes that the Navy does not have a true LO strike aircraft until the F-35 is operational. Thus, the potential joint task force could run into the same access issues discussed in the Georgia example. The easy answer to this problem is to utilize Air Force assets, but these land-based forces require basing or over flight assistance. If this is denied, the mobile USN might have to go it alone. Again, this air superiority scenario could end with significant aircraft losses and eventual defeat for the United States.

The United States is likely to enter conflicts that do not threaten the survival of the country. These small wars often enjoy limited support by the American people for a limited amount of time. In this context, an adversary does not have to achieve a dominating military victory; he just has to make it painful the United States. There is historical precedent for America departing an AOR after ugly incidents such as Beirut and Somalia. Osama bin Laden stated this idea in a 1998 interview with ABC when he pointed out that the U.S. is unprepared to fight long wars and that "...this was proven in Beirut in 1983, when the Marines fled".⁷³ It does not require a great leap of faith to visualize a path where this could occur.

Common Misconceptions

The arguments against emphasizing air superiority fall into three general categories: there is no threat, upgrading the F-15 is adequate, and the F-35 fills the Raptor gap. Threat

assessment and capability have been addressed numerous times throughout this paper. However, it is worth emphasizing one more time that the decisions made today will apply to an uncertain world 15 to 20 years in the world. Just because we can most likely achieve air superiority today does not mean the same platforms can do so in the future. The upgraded F-15, however, is a different discussion.

The fighter number problem will most likely require the F-15C to stay in service for an extended period of time. A best-case solution for this aircraft is that the ANG operates it and functions primarily in the homeland defense mission intercepting Cessna aircraft. Significant improvements to the airframe such as better engines, acceleration, and radar cross section are not fiscally viable. Even to simply remain in service, however, requires a large investment to keep the tired aircraft flying. While augmenting the F-22 fleet, the F-15C will only be able to accomplish tertiary tasks in a permissive environment that does not include high-end threat systems. A British Aerospace and Defense Research Agency study found that the projected F-15 kill ratio against a notional Russian threat achieved a single kill for 1.3 losses while the F-22 achieved a kill ratio of 10:1.⁷⁴ Besides the obvious capability difference between the two aircraft, it does not make fiscal sense to continue flying the F-15C. Last year, the cost per flying hour for the F-15A/D was \$14,588 while the F-22 was \$5,806.⁷⁵ Over the long term, the money used to continue flying the F-15 would be better spent on obtaining more F-22s.

Lastly, it has been said that the Air Force does not need more than 183 F-22s because it would be cheaper to buy F-35s. The design of the F-35 is not conducive to operating alone in a high threat environment, and from the beginning it was intended to be a complement to the F-22. The F-35 flies at lower altitudes and airspeeds than the F-22, which significantly reduces the range that it can employ weapons and its ability to survive in a high threat environment.⁷⁶ Also

it does not have thrust-vectoring, making the F-35 less maneuverable than the F-22. Perhaps the most significant problem is the lack of air-to-air ordnance. With a full load of air-to-ground ordnance, the F-35 can only carry two Aim-120 long-range radar missiles.⁷⁷ Scenarios previously discussed in this paper illustrate how it is possible that the F-22 with six radar missiles could be overwhelmed with pure numbers. All of these issues clearly illustrate that the F-35 is simply not an air-to-air fighter.

Conclusion

The impending air superiority problem boils down to risk mitigation and requirement management. This paper shows how and when American control of the air could be challenged. It is not guaranteed that a potential adversary will exploit this advantage. However, it is certain that in particular circumstances they could. Therefore, the problem becomes a political question in line with Clausewitz's thinking.

To begin with, the issue of air superiority should be brought to the forefront for public discussion. The uneducated have grown to expect nearly perfect results from airpower without an appreciation for what it takes to accomplish the task. The vital prerequisite to this success is logically air superiority. As the primary provider of this capability, the USAF needs to make an honest assessment of future limitations and articulate their results to civilian leadership. Once the cards are on the table, a comprehensive decision can take place determining the place of air superiority in the broader concept of all instruments of national power. This discussion should happen in the next two to four months.

Gen Norton Schwartz, Air Force Chief of Staff, understands that the issue centers on the willingness to assume risk. In a December 2008 interview with Air Force Magazine, he said that the current position of 381 aircraft for the USAF in regards to the F-22 is a "low-risk" decision

while the future proposal will likely be a “moderate-risk” number.⁷⁸ The implication is that the current allotment of 183 aircraft is high-risk or possibly even untenable. However, in the end it is the President of the United States that decides to send American airmen into harm’s way. The President is also the final arbiter in determining what mix of military, economic, information, and diplomatic resources are used to achieve political outcomes. Political constraints are also what often make airpower such an enticing proposition for the United States. The perception is that airpower can be a relatively “bloodless” means to accomplish strategic objectives. There is some validity to this discussion, as was evidenced in Operation Allied Force and during the strikes on Libya in 1986. For these options to remain a viable option for America, air superiority has to be obtained.

The F-22 decision must be made soon because of the imminent shutdown of the Lockheed Martin production line. However, achieving air superiority is not inexorably linked to the F-22. For that matter, it does not have to be achieved by airplanes at all. Future technology such as the Navy UCAV or the ABL could eventually become a force to generate air superiority. Net-centric warfare linking the Aegis, Patriot, and space-based lasers might be the wave of the future. The point is that it is not important how you get air superiority, it only matters if you have it or not. The progression of the American military is putting this question in doubt.

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- ² AFDD 2, 19
- ³ JP 3-01, iv
- ⁴ JP 3-01, 2
- ⁵ 2006 QDR, 1
- ⁶ AFDD 2-1.1, 1
- ⁷ Pape, *Bombing to Win*, 58
- ⁸ AFDD 2-1.1, 3
- ⁹ Mets, “To Kill a Stalking Bird”
- ¹⁰ Hurley, *Billy Mitchell*, 129
- ¹¹ Biddle, *Rhetoric and Reality in Air Warfare*, 168
- ¹² Hughes, *Over Lord*, 306
- ¹³ Crane, “American Airpower Strategy in Korea”, 24
- ¹⁴ Wild Weasel I Final Report, 1
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- ¹⁶ Ibid, 590
- ¹⁷ Ibid, 601
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- ¹⁹ Grant, “Losing Air Dominance”, 24
- ²⁰ Crawford and Moon, “Emerging Threats, Force Structures, and Role of Airpower in Korea”, 121
- ²¹ Grant, “Losing Air Dominance”, 26
- ²² Laszlo, “Secrets of 1999 F-117 Shootdown Revealed”, 26
- ²³ Fulghum, “Indian Scare”, 50
- ²⁴ Ibid
- ²⁵ Ibid
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- ²⁷ Ibid, 192
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- ²⁹ Puska, “PLA After Next”, 189
- ³⁰ Grant, “Losing Air Dominance”, 16
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- ³³ Grant, “Losing Air Dominance”, 10-13
- ³⁴ Grant, “Losing Air Dominance”, 10
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- ³⁹ Vallance, “RAF Operations in the Gulf War”, 31
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- ⁴³ MOA; USN, USAF, USMC, and the Joint Staff on EA-6B Support
- ⁴⁴ Fulghum, “Electronic Attack Takes Off”, 61
- ⁴⁵ Bolkom, “Navy F/A-18EF”, 5
- ⁴⁶ Fulghum, “Electronic Attack Takes Off”, 61
- ⁴⁷ Ibid, 61
- ⁴⁸ Scully, “Needed 200 New Aircraft a Year”, 54

- ⁴⁹ Babbin, “How to Buy The Tanker”, 7
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- ⁵³ RAND, “Entering the Dragon’s Lair”, 85
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- ⁵⁶ Lambeth, “Kosovo and the Continuing SEAS Challenge”
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- ⁶² White, “Structural Flaws May Ground Older F-15s Indefinitely”, 1
- ⁶³ Dunn, AFA Correspondence
- ⁶⁴ White, “Structural Flaws May Ground Older F-15s Indefinitely”, 1
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- ⁶⁹ GAO Report, “Electronic Warfare” 1
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- ⁷³ Hampson, “25 Years Later, Bombing in Beirut Still Resonates”,
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Appendix A (Rebecca Grant, Mitchell Institute)

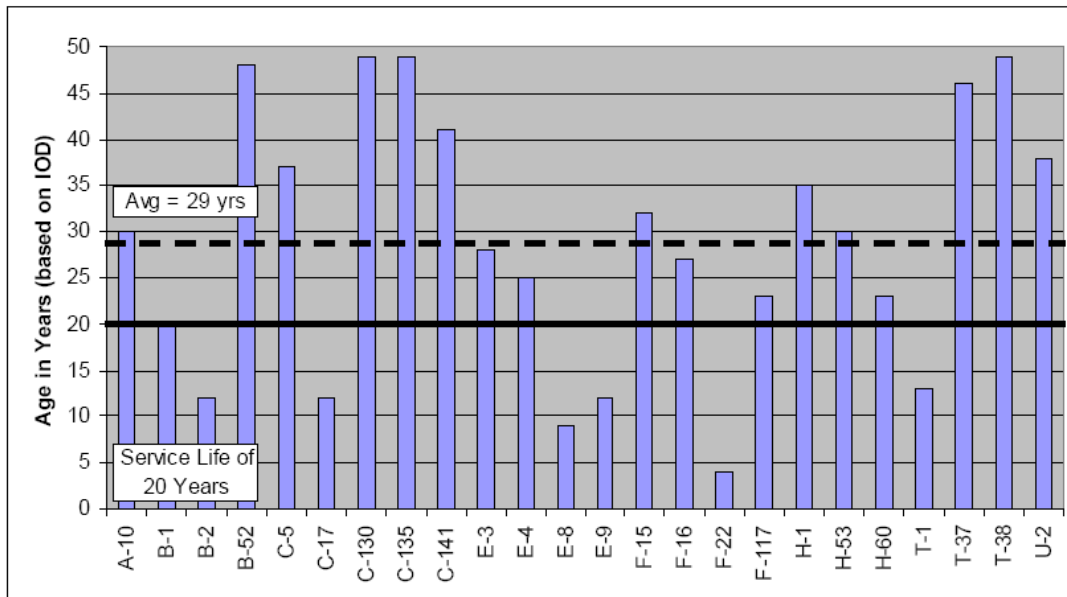
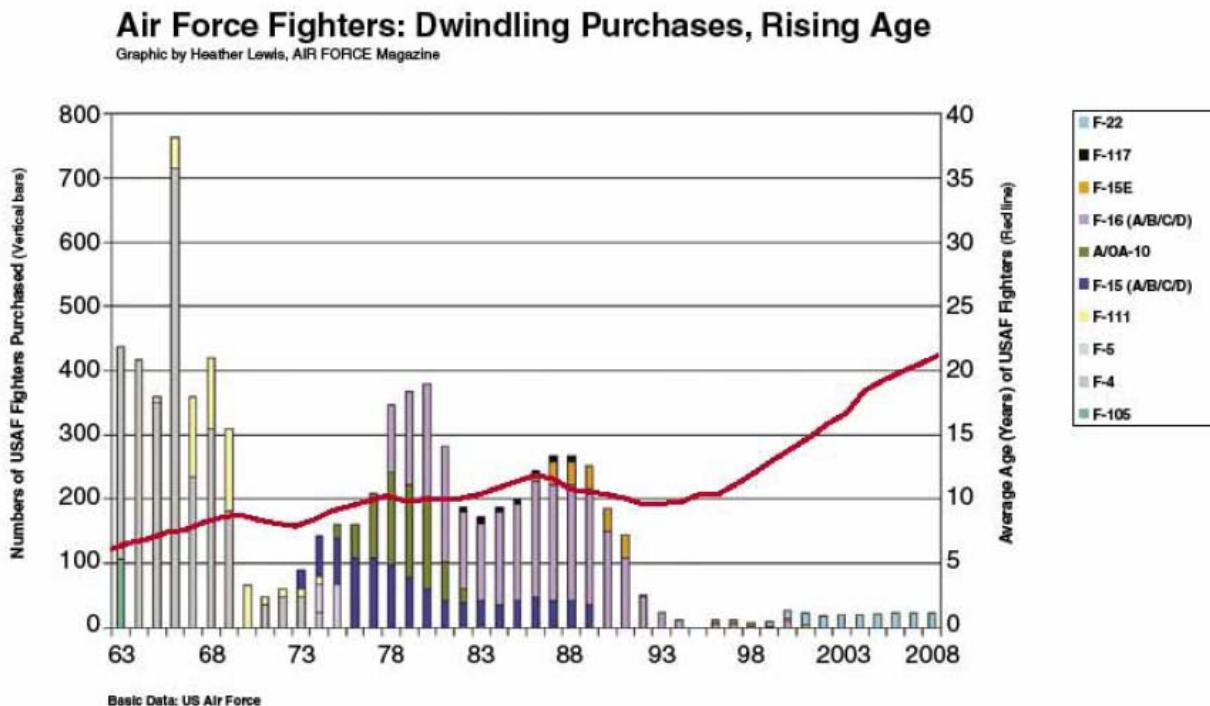


Chart 4.3 - 2005 IOD Age for Various Air Force Mission Design Fleets

Appendix B (Air Force Magazine, Air Force Association)



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